

What is claimed is:

1. An interconnect for attaching a module to a circuit substrate comprising:

an member elongated in a longitudinal direction, said member having at least a first elongated side and a second opposed and generally parallel elongated side, said first and second sides extending in said longitudinal direction;

each of said first and second sides having at least one portion having a series of depressions in said respective first and second sides extending inwardly from a first outer surface of said first side and a second outer surface of said second side; and

wherein said depressions are metallized to form leads.

2. The interconnect as in claim 1 wherein said module is a multi-chip module and said depressions have a generally semi-cylindrical shape.

3. The interconnect as in claim 1 wherein said module is a multi-chip module and wherein each of said first and second sides extends from a first transverse end of said member to a second transverse end of said member; and wherein each of said sides includes at least one portion, intermediate said ends which is free of depressions.

4. The interconnect as in claim 3 wherein said member further includes third and fourth opposed elongated sides extending respectively between said first and second sides and wherein the portion of each of the third and fourth sides associated with the depression free portions of the first and second sides is arranged for receiving a pick and place assembly device.

5. A multi-chip module circuit assembly comprising:
 - a multi-chip module having a plurality of electronic elements;
 - a circuit substrate supporting thereon a conductive circuit pattern adapted for connection to said multi-chip module;
 - at least one interconnect for attaching said multi-chip module to said circuit pattern on said circuit substrate, said interconnect comprising:
 - a member elongated in a longitudinal direction, said member having at least a first elongated side and a second opposed and generally parallel elongated side, said first and second sides extending in said longitudinal direction;
 - each of said first and second sides having at least one portion formed by a series of depressions in said respective first and second sides extending inwardly from a first outer surface of said first side and a second outer surface of said second side; and
 - wherein said depressions are metallized to form leads which connect at least one electronic element of said multi-chip module to said conductive circuit pattern of said circuit substrate.
6. The circuit assembly as in claim 5 wherein said depressions have a generally semi-cylindrical shape.
7. The circuit assembly as in claim 5 wherein each of said first and second sides extends from a first transverse end of said member to a second transverse end of said member; and wherein each of said sides includes at least one portion, intermediate said ends which is free of depressions.

8. The circuit assembly as in claim 7 wherein said member further includes third and fourth opposed elongated sides extending respectively between said first and second sides and wherein the portion of each of the third and fourth sides associated with the depression free portions of the first and second sides is arranged for receiving a pick and place assembly device.

9. The circuit assembly as in claim 5 wherein a plurality of said interconnect members are connected between said multi-chip module and said circuit substrate.

10. The circuit assembly as in claim 9 wherein said multi-chip module includes a first major face and a second opposed major face and wherein first electronic elements are supported said first face and additional second electronic elements are supported by said second face and wherein said interconnect members space said multi-chip module from said circuit substrate by an amount greater than the thickness of electronic elements arranged on said multi-chip module between said multi-chip module and said circuit substrate.

11. The circuit assembly as in claim 10 wherein at least two of said interconnect members connect said multi-chip module to said circuit substrate and wherein each of said interconnect members is arranged toward a different edge of said multi-chip module.

12. A process for making an interconnect for attaching a multi-chip module to a circuit substrate comprising:

providing a member elongated in a longitudinal direction;

forming a series of circuit pads on opposing major faces of said member, said circuit pads being arranged in at least two lines in said longitudinal direction on each of said major faces, with the circuit pads in a line on one major face of said member being aligned with respective opposing circuit pads on the other major face of said member;

forming a series of openings in said circuit pads extending through said member and at least one circuit pad on one of said major faces and at least another circuit pad on said opposing major face, said openings being arranged in said at least two lines;

forming a conductive metalization in said openings electrically connecting each of said one circuit pads to a respective one of said another circuit pads;

dividing said member along a generally central axis of said openings in said at least two lines to provide at least one interconnect member having at least a first elongated side and a second opposed and generally parallel elongated side, said first and second sides extending in said longitudinal direction;

each of said first and second sides having at least one portion formed by a series of metallized depressions in said respective first and second sides extending inwardly from a first outer surface of said first side and a second outer surface of said second side; and
wherein said depressions form leads

13. The process as in claim 12 wherein the step of forming said openings comprises drilling holes through said member and centrally of opposing circuit pads on the opposing faces of the member, whereby said depressions have a generally semi-cylindrical shape.

14. The process as in claim 13 wherein each of said first and second sides extends from a first transverse end of said interconnect member to a second transverse end of said interconnect member; and wherein a portion of each of said sides, intermediate said ends is free of depressions.

15. The process as in claim 3 wherein said member is provided with third and fourth opposed elongated sides extending respectively between said first and second sides and wherein the portion of each of the third and fourth sides associated with the depression free portions of the first and second sides is formed for receiving a pick and place assembly device.

16. A process for attaching a multi-chip module to a circuit substrate comprising:

- providing a multi-chip module having a plurality of electronic elements;

- providing a circuit substrate supporting thereon a conductive circuit pattern adapted for connection to said multi-chip module;

- providing at least one interconnect member for attaching said multi-chip module to said circuit pattern on said circuit substrate, said interconnect member comprising:

- a member elongated in a longitudinal direction, said member having at least a first elongated side and a second opposed and generally parallel elongated side, said first and second sides extending in said longitudinal direction;

- each of said first and second sides having at least one portion formed by a series of depressions in said respective first and second sides extending inwardly from a first outer surface of said first side and a second outer surface of said second side;

- wherein said depressions are metallized to form leads for

connecting at least one electronic element of said multi-chip module to said conductive circuit pattern of said circuit substrate;

forming a sub-assembly by attaching said at least one interconnect member to said multi-chip module to make a desired electrical connection between at least one of said leads of said interconnect member and said at least one electronic element; and

attaching the sub-assembly to the circuit substrate to make at least one desired electrical connection between said at least one lead of said interconnect member and said conductive circuit pattern of said circuit substrate.

17. The process as in claim 16 further comprising having each of said first and second sides of said interconnect member extend from a first transverse end of said member to a second transverse end of said member; and forming in each of said sides at least one portion, intermediate said ends which is depression free.

18. The process as in claim 17 further comprising providing said interconnect member with third and forth opposed elongated sides extending respectively between said first and second sides and wherein the portion of each of the third and fourth sides associated with the depression free portions of the first and second sides is formed to receive a pick and place assembly device.

19. The process as in claim 18 wherein a plurality of said interconnect members are attached to said multi-chip module and said circuit substrate.

20. The process as in claim 19 wherein said multi-chip module includes a first major face and a second opposed major face and wherein first electronic elements are provided on said first face and additional second electronic elements are provided on said second face and employing said

interconnect members to space said multi-chip module from said circuit substrate by an amount greater than the thickness of electronic elements arranged on said multi-chip module between said multi-chip module and said circuit substrate.

21. The process as in claim 20 further comprising providing at least two of said interconnect members to connect said multi-chip module to said circuit substrate and attaching each of said interconnect members toward a different edge of said multi-chip module.